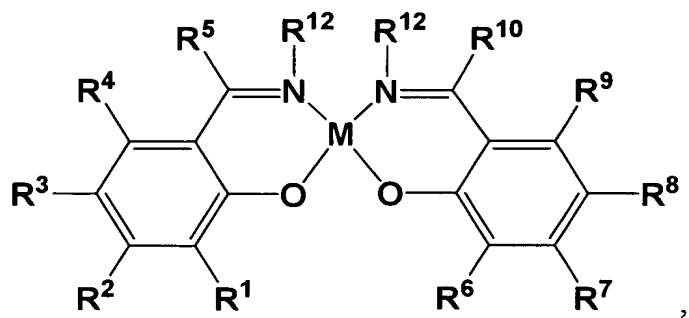
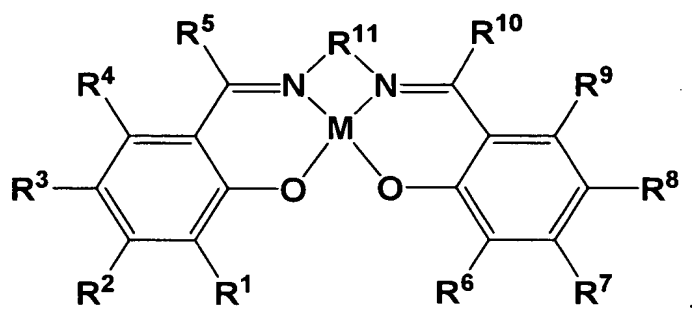


WHAT IS CLAIMED IS:

- 5 1. A heterostructured organic light-emitting device comprising at least one emissive layer comprising at least one host material and at least one dopant complex, the dopant complex comprising a transition metal coordinated to two bidentate NO-type ligands or a tetradentate NOON-type ligand
2. A heterostructured organic light-emitting device according to claim 1, comprising:
 - 10 a substrate having a first electrode on a surface thereof;
a hole transport layer;
at least one emissive layer comprising at least one host material and at least one dopant complex, the dopant complex comprising a transition metal coordinated to two bidentate NO-type ligands or a tetradentate NOON-type ligand;
 - 15 a charge transport layer; and
a second electrode sandwiching the hole transport layer, emissive layer and charge transport layer between the first and the second electrode.
3. The heterostructured organic light-emitting device of claim 2, wherein the emissive layer contains a single dopant complex, which complex dopes the host material.
- 20 4. The heterostructured organic light-emitting device of claim 3, wherein the single dopant complex is present as a monomer, a dimer, an oligomer, or mixtures thereof.
5. The heterostructured organic light-emitting device of claim 2, wherein the host material is at least one member selected from the group consisting of beryllium bis(2-(2'-hydroxyphenyl)pyridine (Bepp₂); 3-phenyl-4-(1'-naphthyl)-5-phenyl-1,2,4-triazole (TAZ);
25 2,9-dimethyl-4,7-diphenyl-1,10-phenanthroline (BCP); 4,4'-*N,N'*-dicarbazole-biphenyl (CBP); 1,3-bis(*N,N*-*t*-butyl-phenyl)-1,3,4-oxadiazole (OXD7); *N,N'*-diphenyl-*N,N'*-bis(2-naphthalene)benzidine (β-NPB); *N,N'*-bis(3-methylphenyl)-*N,N'*-bis(phenyl)benzidine (TPD); 1,3,5-tris(3-methyldiphenylamino)benzene (m-MTDAB); and tetrakis(diarylamino)-9,9'-spirobifluorenes.
- 30 6. The heterostructured organic light-emitting device of claim 2 further comprising a plurality of emissive layers.
7. The heterostructured organic light-emitting device of claim 2 further comprising at least one filter layer.

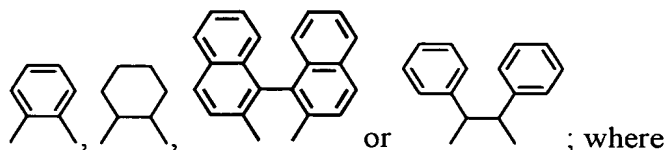
- 5 8. The heterostructured organic light-emitting device of claim 2, wherein the emissive layer is vapor deposited or spin-coated.
9. The heterostructured organic light-emitting device of claim 8, wherein the vapor deposition comprises vapor deposition of at least one dopant complex, which complex dopes at least one host material.
- 10 10. The heterostructured organic light-emitting device of claim 1, wherein the dopant complex is:



or mixtures thereof, wherein

M is selected from the group consisting of Ni, Pd and Pt;

- 15 each R¹-R¹⁰ is independently -H, -OH, -NH₂, -halogen, -CN, -NO₂; -R¹³, -OR¹⁴, -NHR¹⁴, or -N(R¹⁴)₂;



R¹¹ is -(C(R¹⁵)₂)_x-;

- 20 each R¹² is independently selected from the group consisting of -H, -(C₁-C₆)alkyl, -phenyl, -naphthyl; -halogen, and -CN;

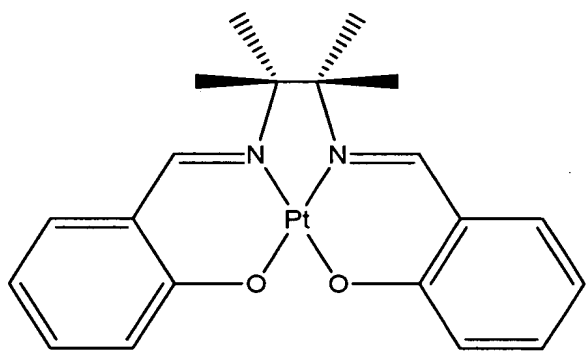
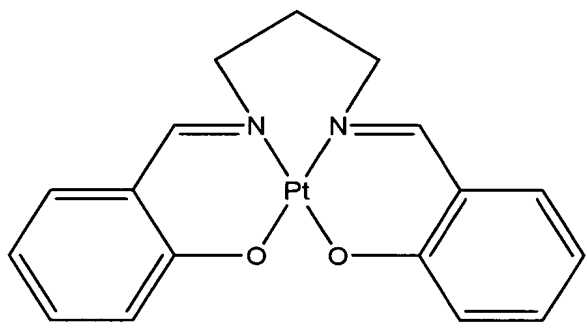
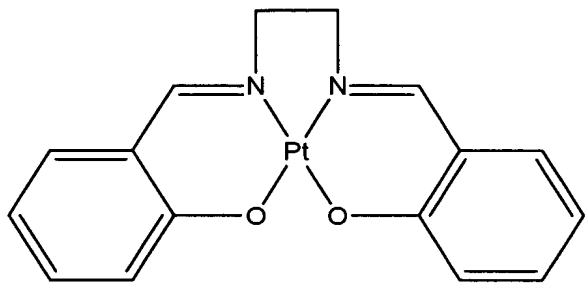
R¹³ is -halogen; -(C₁-C₆)alkyl, -phenyl, or -naphthyl, each of which is unsubstituted or substituted with one or more -(C₁-C₆)alkyl, -phenyl, or -naphthyl;

R¹⁴ is as defined above for R¹³ less -halogen; and

- 5 R^{15} is as defined above for R^1 ;
x is an integer number from 1 to 6.

11. The heterostructured organic light-emitting device of claim 10, wherein M is Pt, $R^5=R^{10}$, $R^4=R^9$, $R^3=R^8$, $R^2=R^7$, and $R^1=R^6$.

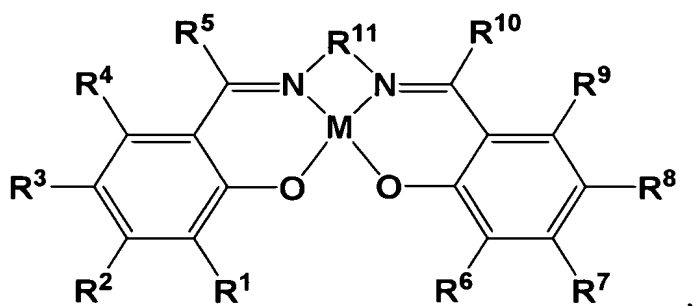
- 10 12. The heterostructured organic light-emitting device of claim 11, wherein the dopant complex is selected from the group consisting of:

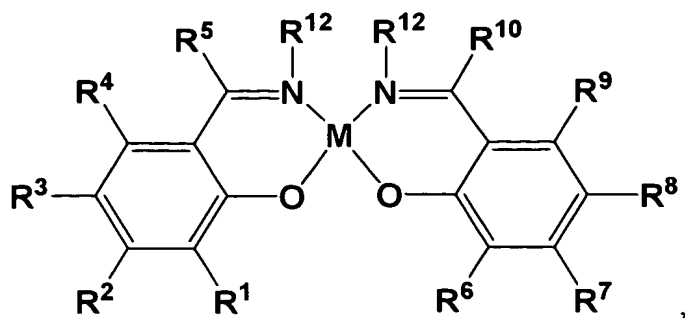


- 15 and mixtures thereof.

13. The heterostructured organic light-emitting device of claim 2, wherein the hole transport layer comprises at least one material selected from the group consisting of beryllium bis(2-(2'-hydroxyphenyl)pyridine (Bepp₂); 3-phenyl-4-(1'-naphthyl)-5-phenyl-1,2,4-triazole

- 5 (TAZ); 2,9-dimethyl-4,7-diphenyl-1,10-phenanthroline (BCP); 4,4'-*N,N'*-dicarbazole-biphenyl (CBP); 1,3-bis(*N,N*-*t*-butyl-phenyl)-1,3,4-oxadiazole (OXD7); *N,N'*-diphenyl-*N,N'*-bis(2-naphthalene)benzidine (β -NPB); *N,N'*-bis(3-methylphenyl)-*N,N'*-bis(phenyl)benzidine (TPD); 1,3,5-tris(3-methyldiphenylamino)benzene (m-MTDAB); and tetrakis(diarylamino)-9,9'-spirobifluorenes.
- 10 14. The heterostructured organic light-emitting device of claim 2, wherein the charge transport layer comprises lithium fluoride, cesium fluoride or lithium benzoate.
- 15 15. The heterostructured organic light-emitting device of claim 1, wherein CIE₁₉₃₁ coordinates describing light emission are substantially $x = 0.33$ and $y = 0.35$.
- 16 16. A method for preparing a heterostructured white organic light emitting diode, the method comprising forming an emissive layer comprising at least one host material and at least one dopant complex, the dopant complex comprising a transition metal coordinated to two bidentate NO-type ligands or a tetradentate NOON-type ligand.
- 17 17. A method for preparing a heterostructured white organic light emitting diode according to claim 16, the method comprising the steps of:
- 20 providing a substrate upon having a first electrode on a surface thereof;
providing a hole transport layer on top of the first electrode;
forming an emissive layer on top of the hole transport layer, the emissive layer comprising at least one host material and at least one dopant complex, the dopant complex comprising a transition metal coordinated to two bidentate NO-type ligands or a tetradentate
- 25 NOON-type ligand;
providing a charge transport layer on top of the emissive layer, and
providing a second electrode on top of the charge transport layer.
18. The method of claim 17, wherein the dopant complex is:

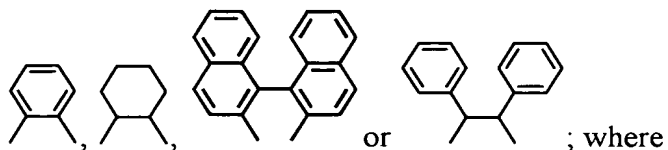




or mixtures thereof, wherein

M is a metal selected from the group consisting of Ni, Pd and Pt.;

each R^1 - R^{10} is independently -H, -OH, -NH₂, -halogen, -CN, -NO₂; - R^{13} , -OR¹⁴, -NHR⁷, or -N(R⁷)₂;



R^{11} is $-(C(R^{15})_2)_x$;

each R^{12} is independently -H, $-(C_1-C_6)$ alkyl, -phenyl, -naphthyl; -halogen, or -CN;

R^{13} is -halogen; $-(C_1-C_6)$ alkyl, -phenyl, or -naphthyl, each of which is unsubstituted or substituted with one or more $-(C_1-C_6)$ alkyl, -phenyl, or -naphthyl;

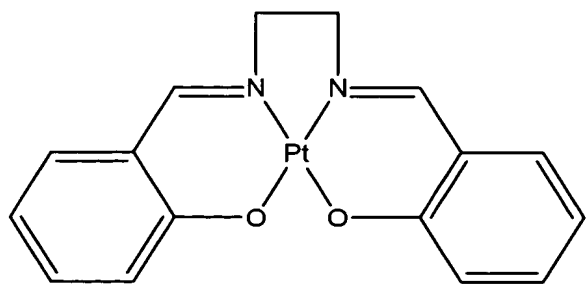
R^{14} is as defined above for R^{13} less -halogen; and

R^{15} is as defined above for R^1 ;

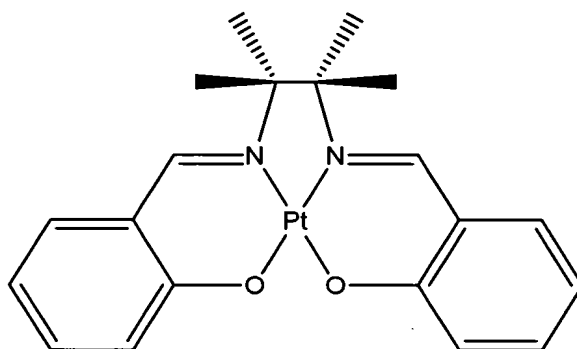
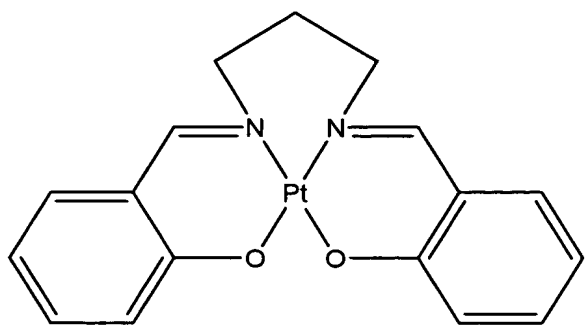
x is an integer number from 1 to 6.

19. The method of claim 18, wherein M is Pt, $R^5=R^{10}$, $R^4=R^9$, $R^3=R^8$, $R^2=R^7$, and $R^1=R^6$.

20. The method of claim 17, wherein the dopant complex is selected from the group consisting of:



5



and mixtures thereof.

21. The method of claim 17 further comprising the step of changing a color of light generated by the diode by one or more of increasing the concentration of the dopant complex; generating white light with a low concentration of the dopant complex; reducing the range over which light is emitted by the emissive layer; adjusting the concentration of the dopant complex to be within the range from about 2 % to about 5 % based on the weight of dopant complex and host material; and adjusting the concentration of the dopant complex such that CIE_1931 coordinates of emitted light are substantially $x = 0.33$ and $y = 0.35$ or 0.33 .
22. The method of claim 17 further comprising incorporating the organic light emitting diode in a display.